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Adventures in the Not Quite Yet:

using performance techniques to raise design awareness about digital networks

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Abstract

Technologists promise a future in which pervasive, distributed networks enable radical change to social and political geographies. Design of these abstract, intangible futures is difficult and carries a special risk of excluding people who are not equipped to appreciate the ramifications of these technological changes. The Democratising Technology (DemTech) project has been exploring how techniques from performance and live art can be used to help people engage with the potential of ubiquitous digital networks; in particular, how these techniques can be used to enfranchise people with little technical knowledge, but who nonetheless will have to live with the design consequences of technical decisions. This paper describes the iterative development of a performance workshop for use by designers and community workers. These workshops employ a series of simple exercises to emulate possible processes of technological appropriation: turning abstract digital networks into imaginable, meaningful webs. They were specifically designed to target a technologically excluded group, older people, but can also be used with other groups. We describe the process of workshop development and discuss what succeeded with our test groups and what failed. In offering our recommendations for working in this space, we consider the methodological issues of collaborating across science/art/design borders and how this impacted on evaluation. And we describe the final result: a recipe for a performance workshop, also illustrated on a DVD and associated website, which can be used to explore the dynamics of technical and social change in the context of people's own lives and concerns.

Keywords

Performance; Older People; Marginalisation; Person-Centred; Ubiquitous Digital Networks; Interdisciplinary; Technology; Future; Evaluation

Digital technologies are connecting together new aspects of life; from automated monitoring in care homes to voting by text message. Everyday activities are becoming tangled in intangible, abstract networks of computation. This increasing inter-penetration of the digital and the domestic creates the potential for increasingly radical social and political change. Arguably, we are in the midst of one of the biggest transitions facing the world – from pre-network to network. This carries with it implications for the parts of

the world that feel the effects without implementing the benefits. It is difficult for the people subject to these changes –ordinary users- to engage with the possible ramifications of abstract concepts such as the ‘internet of things’. This in turn increases the risk of implementing expensive systems that either fail or impose, intrude and offend.

The DEMTech project is conceived to explore new ways to give the people most marginalised by these developments a greater voice in them. The central idea is to take advantage of techniques in contemporary performance to emulate processes of technological appropriation: helping people to turn abstract systems that do not yet exist into imaginable discursive material. In particular, we seek to equip those most excluded from technological change with new ways to apprehend, address and evaluate the possible social and political worlds it creates. DemTech embraces a person-centred view of knowledge about society’s needs. It has been underpinned by the belief that to move into the complex territory of pervasive networks as a society, without widening the opportunity for ordinary citizens to contribute their wish-lists and consider the drawbacks, is inherently undemocratic.

Although ostensibly similar to work in the participatory design movement (Muller, 2002), the aim here is to equip ‘experts in the practices of everyday life’ with tools that enhance their ability to contribute to social, political and ethical debates about the nature of design in ‘the not quite yet’ rather than particular futures workshops or design opportunity spaces (Hornecker et al, 2006). Given this focus, we have chosen to limit our review of design literature. Instead, we concentrate on showing how we made decisions as part of designing our research, giving a more empirical rationale. We hope that, by showing our research process as well as its outcomes, we can make a contribution to the literature on interdisciplinary designing as well as show our outcomes. In particular, we look at the interdisciplinary tensions in working across the science/art/design borders, especially as concerns evaluation.

Context to the work

DemTech set out to consider the needs of the world in the near-future, labelled ‘the not quite yet’ (Light et al, 2006) to domesticate the unknowable wilds of unlive time and turn it into a concept that people can handle more easily. In particular, we addressed the future of computers’ role in ordinary life. If we accept that the advent of pervasive computing is making huge demands on interaction designers in going beyond *product* or *service* design to a huge web of functionality with unexpected interdependencies, then we can anticipate what difficulties non-designers, unversed in imagining possibilities, must face in grasping its implications.

Our research question was, given this challenge, to explore how we might make it easier for people who are quite clear about how they want to live their lives, and about the relationships they value and what values they want to uphold, to bring this knowledge into play when talking about the design of the networked society (Castells, 1996). Would it be possible to create a mechanism of engagement to include these social experts in discussions with design experts, politicians and so on?

To test this, we needed to work with groups of people that do not regularly engage in designing obscure technologies. This cast the field wide. We chose to explore the challenge with a diverse group who had considerable experience of life and changing social norms but very little voice in the design of technologies: older people.

Marginalisation from design

Older people are marginalised with regard to digital technology in a number of ways. They are not big users. The Oxford Internet Survey (<http://www.oii.ox.ac.uk/microsites/oxis/>) shows distinctions in British internet use across gender, types of service, social class, etc. By far the most salient 'digital divide' is one corresponding to age group. Less than one in three retired people use the internet. This contrasts with nearly 100% of students. For sheer quantities, those excluded by the accident of their birth-year outnumber any other identifiable slice.

But this divide extends more broadly: to the way that products and services are designed without thought to the needs of ageing people (Clarkson et al, 2003). Growing awareness of this lack has produced both a movement towards inclusive design (ibid) and limited participative design experimentation (Luck 2000, Newell et al, 2007), where older people are not only tested as potential users of new systems but are involved in helping in the design process. However, the focus of inclusive design has remained on usability and accessibility. We see this as a crucial feature of good inclusive design, but we distinguish the work reported here. Though we are interested in improving design by making it more inclusive, we have chosen to focus on choice, voice and imagination, rather than levelling the playing field through access alone. This decision is informed by a belief that participation drives change, as well as the other way round.

Our participants

Thus we chose to work with (predominately) over 65s because of their likely distance from the heart of innovation - though being the most diverse of age-groups, it is hard to generalise. Our participants were typical in their disparate life experience, education and skills and different levels of fitness and infirmity. Only the cohort effect of growing up through common times united our sample: for instance, they had familiarity with certain kinds of technology and not others. However, even in this, life opportunity and experience widely varied.

In all, we took our plans to, and subsequently worked with, five distinct groups of older East-End Londoners, aged from 63 to 89. These groups were primarily identified through contacts with local communities, supported by Simpson's outreach activities at SPACE and through Weaver's previous performance work. We chose to work with existing groups (The Bow Women's Choir, The Geezers, S-AGE at the Sundial Centre and AGLOW), where possible focussed on a particular centre, so that location and access was a less prominent organisational issue and we could harness the benefit of existing social relationships, rather than make initial team-building a focus of our group-work. They chose to work with us because they thought the project sounded interesting and they liked the idea of supporting research. With their

permission, we recorded all our interactions and involved some of them as mentors to the project. Unfortunately, we do not have space here to report how we made our methods suitable for older people or what particular cohort effects we found, though these were interesting aspects.

Democratising Technology

DemTech asked: can we produce a generative, open-ended form of engagement, regardless of the marginalisation of participants? And in answer it produced a workshop for use as a transformational tool. The workshop is based in performance methods and was formed working with community groups chosen for their remoteness from discussions of technology. The shape of the workshop, the issues it raises about digital networks and participation, and the individual techniques from which it is constituted are intended for use by drama/community workers and designers and are now available on a DVD and website.

DemTech also held a series of events, in particular an exhibition, *The Not Quite Yet* (<http://www.thenotquiteyet.net>) at which several artworks based on the workshop research were shown. We will not focus on these other activities except where they demonstrate the impact of the workshops on our participants. In this context, we will quickly introduce the summative public symposium 'On the Margins of Technology', held at the end of the exhibition, which was a day of presentations and debate about the potential of technology for expanding and diversifying participation in society, with an emphasis upon participation and older people.

The mission of the workshops

We began with the belief that existing means of engaging people in discussion about the future involve too much of other people's ideas. And we wanted to test the approach, proven in other fields of education (eg Laurillard et al, 2000), that, to contribute, people don't need to learn technicalities, they need an organised and directed space in which they can make connections and prepare their own narratives. So, we wanted to build on a person-centred philosophy and an experiential learning approach that allowed values and opinions to come through while remaining on the theme of the future and what digital networks would mean. The challenge was to find as small a seed of content stimulus as possible that would ensure that:

- some relevant creative work could be undertaken,
- but the nature of it would be determined by the participant.

The potential for impact

There are many components in participating in design decisions, especially as they relate to digital networks. In creating our workshops, we interpreted these to be:

Forum – a space to contribute and people to listen

Motivation – the desire to contribute

Articulacy – the vocabulary and fluency to present one's ideas in a particular domain

Confidence – the assurance to become involved

Knowledge – enough understanding of the topic to have an opinion

Agency – an awareness that change is possible and that oneself is an agent of change

Association – the ability to interpret things together or see links, in particular: old and new, people and things, things and things, etc.

Transformation – the act of combining to make new ideas, concepts and associations

We hoped in particular to work with the areas of agency, association, transformation and articulacy, expecting these to yield an increase in confidence and motivation as well as a more skilled approach to considering design. We also hoped to give some forum opportunities in later parts of the project. This emphasis is in marked contrast to much thinking about teaching people about technology, where knowledge is considered the starting point for the work. In fact, knowledge is the exception in the list of components above because it stresses particular content: what are people to have knowledge about?

If it is *technical* knowledge, believed to be necessary for an informed opinion, this would involve right answers based on up-to-date technical knowledge and skill. Instead, we argued that the knowledge needed was a more human-centred one, based on the practices of everyday life, and the questions to ask might be: What do I want our world to be like? How might I connect up the things that matter to me so that I am happy, stimulated and well-supported?

However, though people may be knowledge experts if we frame the task in this way, they are unlikely to know how to apply it to such an obscure field. Interaction with networks is an abstract concept, seemingly remote from ordinary life and more about connections than individual things. Therefore, we wanted to develop people's abstracting, associating and transforming abilities so that their existing understanding could be applied in new ways.

Using Performance

Performance is unique in its sustained development of methods that engage people in envisioning and altering their own possible futures. It allows for dynamic shifting between abstract and concrete instantiations of desirable social solutions and the functions that support them. In this sense, it has much in common with designing practices. But it has been used most in its social incarnation as a means to transform attitudes and prepare people to deal with change. Shifting between 'real' and 'practice' situations is a powerful way to support empowerment (c.f. Theatre of the Oppressed changing legislation in Brazil, Boal, 1998).

Much futures work in the technology field begins with a scenario (Little and Briggs 2005) and this is often how drama is used to enhance it (see Newell and Morgan 2005, Newell et al 2006 for a discussion of the use of theatre in HCI and design). By contrast, DemTech's goal was to find a person-centred methodology to learn what people would create when responding to an unfamiliar set of possibilities on their own terms. It is this meeting of their

experience with a new context that interests us because it holds the promise of a wider franchise for design decisions based in absorbing the everyday features of a technology – but everyday features vary from person to person.

We explored a series of techniques based on the performance art of Lois Weaver, which cumulatively builds personal narratives from minimal seeding of ideas through use of a highly person-centred approach to performance. Weaver's work has a particular relevance for the project's goals in that it starts with the individual and works outwards, rather than presenting any kind of scenario or script (Weaver, 2003, 2007, forthcoming).

Method: where we began

We used an iterative design method for developing our workshop content and structure. Our learning took place during these iterations and became, in effect, the design narrative. Another critical feature was the way that the interdisciplinary character of the team conducting the work affected our outcomes. For this reason, we will show how we approached the design of the workshops by presenting highlights from the design narrative and combining sections on method and findings, summing up both development and value in the subsequent discussion.

The performance artist's practice

To explain our process requires us to start with what Weaver brought to the workshops and how her practice informed ours. Weaver's work stresses impulse and association. Her work with a new group is to break down the inhibitions that stop imagination flowing freely and to shift people's thinking out of well-worn paths. In all our work, she began this breaking down with a technique she calls 'Body Hoo-ha'. This involves going round in a circle inventing and copying small actions in increasingly elaborate exercises based on gesture and sound, to free up the mind and body. Forms are made safe through repetition - and the success of not humiliating oneself in front of everyone else. (Clearly a non-judgemental inclusive leadership is essential here.) All activities have a slow build through them and techniques that appear later in the session hark back to earlier exercises so that the day is incremental, as well as each section. Weaver has developed a means of taking people from the here-and-now to the 'what if' in this way.

So less demanding tasks preceded more challenging ones in an incremental build-up to a shift to *making* activities. Two key Weaver *making* methods (2007) were absorbed into the workshops and determined the structure of them:

Fantasy Persona

Once the group is warmed up, each person is asked to identify a quality that they would like to have. This quality is made the source of a series of movements expressed in the style of that quality: "In which part of the body can you feel that quality? Now lead with it". The person moving with this quality might then be named and in this way a persona is formed. The participants are then exposed to a group of props such as wigs, hats, gloves, swords and magnifying glasses and can choose one that encapsulates the qualities of the persona (see image 1). This accumulation of properties leads, without any single exposing act, into building an alter ego to work through.



Image 1: some props to develop personas with

In Weaver's practice, talking through the persona has the benefit of encouraging a greater disclosure than activities taking place directly with the individual. For our purposes on DemTech, we could benefit from the other effects of creating a persona: association with an 'other' self and the defamiliarisation (Light et al, 2008) of what the 'other' self does, believes, etc. Creating a persona stretched to absorbing what a persona does and has, almost like the design-persona (Cooper, 1999) development process from within. And we found there was a sequence through which people travelled in projecting themselves out of themselves and their current experience, which could be led to culminate in the creation of new artefacts by a rolling shift of narrative focus:

self – experience – body – thing that creates other self – other self –
experience of other self – thing that enables experience of other self

This process of embodying and abstracting proved useful for creating fantasy interactive products, yet it was a solo activity and we were keen to encourage a more social engagement. And we wanted to look at networks and the links between things, not the things themselves. So we adapted it.

The Paper/Making Exercise

Another Weaver technique, created to give women in prison some idea of what 'creating' is, involved a single sheet of paper and a list of words, or 'recipe'. Participants were asked to write down the answer to a number of questions on a blank sheet of paper. The particular questions are less important than the fact that the questions all concern the individual involved (or their persona if working through the fantasy personas...). So it might be to record two truths and a lie about oneself. Once this is done, the 'recipe' is finished and the making begins. Using only the ideas on the sheet and the sheet itself, folded, torn or handled in any other fashion, the participants are to make a thing out of it

This device was used in the DemTech workshop to warm participants up to making things, while ensuring that the things they made were centred on themselves and their own experience and desires. This approach can be seen to capture the person-centredness of our non-technological reading of

knowledge and our desire to work with structure to allow content to appear from participants. But, though very successful at encouraging a productive approach, it again stressed the solo and the product-focussed.

Method: interdisciplinary negotiation

By the start of the workshop trials we had designed Weaver's interactions to be about people and *things* rather than self expression and developing performance. And our first workshops ran with some underdeveloped attempts to take this into a more networked terrain, not all of which worked. Least successful was an exercise, supposed to render visible the many connected moments that make up someone's day that merely left bemused people holding handfuls of ribbon. There may well be potential in this kind of embodied metaphorical mapping, but it seemed overly complex to pursue.

However, before discussing more effective techniques, we need to give some insight into how we attempted to measure effectiveness, since systematic analysis became the major inter-disciplinary challenge.

Evaluation: Art vs Science vs Design

Imagine the team meetings: a performance artist, a media arts strategist and two social scientists working in computer science (one in cognitive science experimentation and the minutiae of interpersonal interactions; the other, interaction design fieldwork and participatory practices with a background in drama teaching). Several points of inter-disciplinary difference appeared rapidly.

Most fundamentally, the question arose as to how we should evaluate our activities. Evaluation of art has always been fraught, usually conducted by expert critique. Evaluation of science hangs on contribution to research. And design is about fitness for purpose. To create art one exposes an individual/collective vision to an audience. To do design one needs to establish an intended endpoint and produce a narrow effect on a chosen constituency. Which is to say that criteria for how to design evaluation procedures differed.

Not only that, but the fluidity of the artists contrasted with the more deterministic purposes of the scientists, while the intention to do creative development work to a predetermined end offered a constraint to synthetic practices that the designer welcomed more than the artists. Which is to say that end goals, and indeed *approach* to goals, differed.

Further, we agreed that to inspire and engage people in person-centred activities, one needs sensitivity to people, responsiveness to the particular context and spontaneous creativity with the tools at hand. Spontaneity contrasts with the control needed to establish cause and effect and recognisable repeatability, if not in specified output, then at least in the patterns discernible in the output. Thus, the needs of practice and analysis were partly opposed and required careful balancing. In other words, we wanted to be 'person-centred' but only if we could still show that we had changed people in the way we intended.

An example of differences during a management meeting will illustrate the depth of the gulf. In a discussion about consistency, we considered the one-

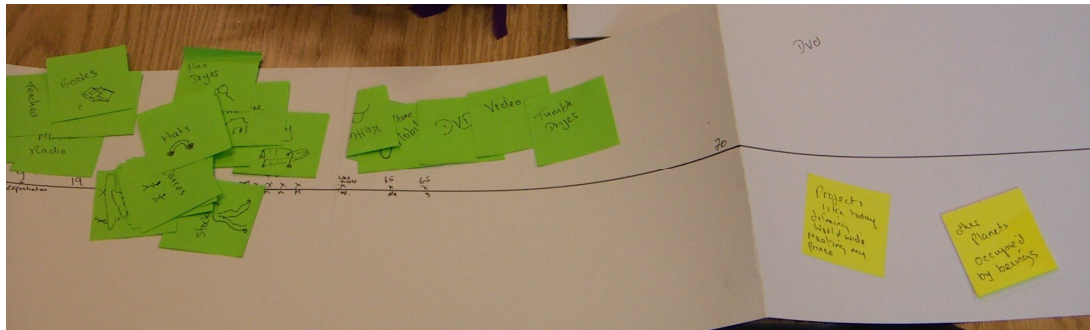
off presence of outside observers. "Outside observers will change the dynamics by making people feel observed," says one. "We won't let them change the dynamics, we'll involve them in what we're doing and adjust the exercises to include them," says another, practically. "But that will change the exercises," suggests the third. Each position is consistent with the speaker's worldview, but together they reveal two different notions of consistency. The process of negotiating desired outcomes and ways of evaluating these was slow and valuable and benefitted from long management meetings at the outset, where vocabularies were calibrated, and tensions raised and allowed to inform the design of the research¹.

Eventually we agreed upon a before-and-after evaluation tool with the following stipulations: that the content of it must avoid prejudicing the behaviour of participants (scientists); that it had to be designed into the activities of the workshop so that its presence didn't destroy the mood of the event (artist/designers). A description of the tool follows.

The evaluation tool – a timeline

We created a timeline evaluation tool. At the start of the first section of the workshop, people would populate the past with things and events and then take that activity into the future (see image 2). At the end of the last section of the workshop, they would return to their timelines and add any further thinking to the future. The richer detail would reveal if we had changed the quality of their engagement with the topic. As a device, this failed in some interesting ways. It also produced some lovely graphics that were hung in the subsequent exhibition and served as a prompt for discussions about changing technology.

Yes, the future section of the timeline did get more populated after the workshop and in ways that showed greater engagement with forward-looking issues, but these were not *thing-* or *network-*related, despite lots of interesting *thing-* or *network-*related outputs during the workshop from the same people. So, we had more evidence from comments and behaviour about effectiveness than we had if we considered the timelines as indicative of a change in state. The timeline seemed to attract environmental worries and so on. Further, it revealed nothing about which aspects of the workshop might have generated appropriate change – it could only handle before and after effects.



¹ Subsequently, the design of the workshops over extended iterations was conducted by a sub-group and it became harder to incorporate the joined-up vision of the team and keep the sense of shared learning.

Image 2: a timeline after the first session, showing more in the past than the future

Some interesting side-effects to using the time-based tool are worth noting:

- The past: participants lovingly filled in events and memories from their past, relating these to major milestones such as leaving school, getting a bicycle and the Blitz. It was a great opener of conversations, if not the right ones. Although it did generate discussions about the arrival of televisions, for instance, it also set an agenda of talking historically, more often placing people in epic rather than everyday contexts. Getting people to talk about things they remember and how they functioned helped them talk about the functioning of new things, but it tended to increase the existing drag towards stand-alone products and away from networked devices.
- The future: we were anyway in doubt about the use of the term 'future'. We named our related workshop (Light et al, 2006) and subsequent exhibition after 'The Not Quite Yet' to bring it out of the wide blue yonder, as noted. Talking about 'the future' mostly produced a stock response: things to come were space travel and teleporting. It appears that we form our notion of the future at a young age and don't necessarily update it. The other reaction was fear for the future – we encountered very little optimism around what was to come and a fatalistic view of their own remaining lifespan², yet, presented in a different way, participants were very engaged in making change, problem solving and planning, with a real desire to contribute.

So, we concluded that talk of the past and future was better left out: *spatial* framing of networks should replace *time*-based talk.

Evaluation without the evaluation tool

Without using the timelines as an evaluation tool, we relied wholly on iteration based on observation. This is to say that we designed a package of techniques, tried them out with our groups, discussed the contribution each technique seemed to have made and whether the order was optimal, modified an aspect of our design based on our observations and then tried out the new version in as close to the same conditions as possible. Of course, the conditions varied: running group-work is never the same twice. However, it is also possible to consider a range of factors and look for likely cause and effect and this became part of our practice in developing versions.

Specifically, this ongoing evaluation was conducted by talking to participants at the end of the session and reviewing video of what participants had said and done. Weaver as facilitator was accompanied by the same researcher to watch, help shape each session and record changes. Together, we adapted the techniques we presented based on learning from former workshops. Of course, since each participating group differs from the last, any version of the workshop deemed successful had to be tested multiply. The final evaluative process owed a lot to Action Research, which is anyway a designerly form of social research in that it seeks to make change and then evaluate it for

² One depressed participant merely put the word 'DETH' in her future.

effectiveness. The evaluation was thus more closely related to creative practice than seemed likely at the start. Peer/participant review and effectiveness in use became our standards; we arrived at our programme by relying considerably on empathy and we recognised that many exciting aspects would never be repeated. (Indeed, we could not claim to have developed a person-centred approach if they could.)

Taking products into networks

If we now return to the development of the workshops, we can frame our progression by placing it in this interdisciplinary and negotiated context.

Having worked with some groups to make products using the Fantasy Persona and the Paper/Making Exercise, we assessed how far we had brought people to a new understanding – even implicitly – of the nature of networks and concluded that we had edged our participants closer to the world of product design (and indeed experience design), but not contributed real insight or techniques for grappling with the complexity of networks. If anything, by drawing attention to the nodes in the system, we had diverted attention away from links and relationships.

Web of links

To emphasise associative skills and begin the process of considering desired relationships, we experimented with the socio-dramatic technique (Moreno 1985, Sternberg & Garcia 2000) of relationship mapping. To encourage our participants to develop a web of relationships, we asked them to put an object of theirs on a sheet of paper and draw out from it some of the things they connected with it. Weaver then asked them each to tell one of the link stories and to name their web/network. This helped to draw out the meshed nature of it. (The links, and the names chosen for the network, often became intensely personal. We had earlier rejected putting the participants themselves at the heart of the web because our experiments with it introduced concerns about self-revelation – something we were not seeking to encourage – while working less well with the final overall shape.)

Pulling it together

The final shape was given to the individual's work by pulling all the creation of the earlier sections together with an exercise in pairs that focussed on interconnections. This exercise was to create a world/system/context/scenario in which any of the paper objects made by the two fantasy personas in the pair and the real personal objects sitting in their web of links could work together to do a desired task. This gave the pair four objects to choose from, each surrounded with a dense collection of associations to help in thinking about how they might be connected up. At this point, the focus of the workshop could be made explicit: a brief statement about a network of things and the developing shape of computer science fed into orientating the designs and putting them in context.

And we added a videoed 'interview' with the pairs of participants to encourage them to improvise greater technical detail about their inventions

without apparently moving into technical territory. As Hohmann (2006) notes, people do more work on imagining the detail of a situation that has moved into the past than they do in some unspecified future. Thus, we used questioning in a future-past setting. Technical aspects were treated lightly, with questions such as "How did you design it to produce the answers to those questions?" accompanying others such as "What influenced you in coming up with your invention?". Finally, the group, having watched each pair interviewed, could be asked to draw up a manifesto of important things to include or avoid in designing new connections.

Thus, we adapted Weaver's way of working for the purposes of these workshops, turning her generic practice into an educational process pointing towards digital networks.

Further points

A few more general observations can be added to this description. For instance, we avoided talking about 'technology' *per se* in introducing the workshops. We felt the term would prejudice participants to think what we were interested in was something remote and unfamiliar, a topic upon which they were not expert and for which experts exist. This view was endorsed by participants: "Technology is a nasty word: don't use it," Vi Davis said later in a planning meeting for the symposium, *pers comm.*, 2008).

Another approach, seemingly at odds with generating a creative environment, is to critique existing design as an entry to talking about further options. We started one session discussing things that already exist but, quite apart from introducing specific subject matter into the workshop, it led thoughts onto a negative and critical path with a focus on incremental change. Despite an open introduction, it quickly became a complaints session with little positive analysis. At the end, participants reflected on the disconnection between this section and the rest of the work, saying they would have preferred more emphasis on finding creative ideas and freeing themselves from censoring behaviour. This was the only group that experienced this contrast and the only group that commented on the need for further anti-censoring work (though this cannot be regarded as more than indicative with the small sample involved). We observed that the negative thinking of the first part was a pervasive element in the rest of that day and concluded that the critical thinking our discussion had inspired had too much in common with censoring behaviour to make it a useful activity.

Reflections

The final workshop shape contained some generic types of activity for person-centred content to fill. We were able to keep Weaver's open and generative methods but expand them towards networks, taking them away from character and product. We do not suggest that these methods can be reproduced exactly, but we offer them as a way of thinking about engaging marginalised people and giving them access to the intangible aspects of ubiquitous digital networks; in particular, the social relations that can be mediated by the technology.

Evaluation

Ultimately, we had several forms of evaluation. As noted, once a stable form of the workshop seemed to have appeared, it was repeated with small tweaks and then, last, presented for peer review of designers and drama workers as an experiential day. It was well received as workable and likely to stimulate useful thinking with marginalised people. However feedback included the thought that depending on how exercises were introduced some participants might become more interested in the quality of their role-playing than devising the content for the roles and so such barriers would need working through.

Then there were the systems participants produced at the end of the workshop, which showed varying degrees of engagement with ideas about networked digital tools. The communicative element featured large, with many wearable solutions and speech interfaces, as well as some telepathic techniques. People who were not used to thinking about interfaces at all were deciding on the fly how they wanted to interact with what they had just invented. Much of this was not novel in the sense that it will supply new forms of interaction for designers to work with – it was novel to the participants and shifted their sense of what they knew about and could do. Some more extreme systems included a hat that could conclude unfinished business with the dead, a glove that could give information about the intentions of the person it was touching and an injection that could provide two weeks' holiday without the need to move.

We also had the more nebulous opportunity to observe how the older people we had been working with responded to the opportunity to participate in the artworks and public symposium of the next stage of the project. Several participants spoke about their involvement in the project at the symposium, choosing to share their experience with the public. The high level of engagement shown by participants in taking the work forward was encouraging: a sense of agency and increased confidence did seem to be outcomes, as well as a willingness to talk about technologies, though mostly about those that used to, or currently, exist. One group is still extending subsequent DemTech work with an artist to see if they can make their scheme for using water turbines to harness renewable energy sources into a real project. And their productivity and enthusiasm served as inspiration for others.

A limited by-product was increased confidence with technology as well as the idea of it: a man is being taught to use the internet by his wife to do some research; a woman is now happy guardian of her group's new laptop.

In summary

We can sum up the findings of the research by listing the main processes of transformation that worked with the test groups. The key points we discuss are:

- Comparing working with generating products to generating network-based ideas;
- Learning that teaching about the future in the context of networks is better done in mapping of space, not time;

- Taking the journey from key personal narrative to new narrative, using progression from self, to experience, to fantasy experience, to tools for that experience;
- Shaking people out of their usual habits – challenging self-censorship, using gentle disorientation including using body and different bits of the brain, such as associative thinking;
- Eschewing a 'problems with technology' approach.

All these learnings are extracted from the narrative of our development of the workshop techniques detailed above and offered for further experimentation for others.

Although we have received encouraging feedback both from participants and from our peer reviewers, we know that this is only the beginning. It seems we have ahead of us a long development process for techniques that deal with technological complexity in simple social ways. This is particularly true if we are taking marginalised people forward as design partners, even to the extent of promoting meaningful democratic participation in the society that emerges from the next wave of technological implementation. While we were able to detect a degree of success in the processes we advocate here, we also had the opportunity of discerning just how difficult non-specialists found thinking about ubiquitous digital networks. We anticipate the need for considerably more work if expensive, possibly ineffective, but certainly exclusive, decisions about digital network infrastructures are to be avoided. We would advocate more work in this field if a broad insight from active informed citizens is to be gained in good time.

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Lois Weaver is a performance artist, director, writer, teacher and curator with twenty years professional experience. She was co-founder of Spiderwoman Theatre and the WOW Theatre in New York and Artistic Director of Gay Sweatshop Theatre in London. She has been a performer, director, and writer with the Split Britches Company since 1980. Her interests include performance and human rights and performance and technology. Lois was Director for PSi # 12 Performing Rights, an international conference on the themes of performance and human rights and for East End Collaborations, an annual platform for live artists. Lois's touring performances include *Dress Suits to Hire*, *What Tammy Needs To Know* and *Diary of a Domestic Terrorist*. Lois is a graduate (Theatre Arts and Education) of Radford University and now lectures as Professor of Contemporary Performance Practice at Queen Mary, University of London.

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Patrick GT Healey is a Reader in Cognitive Science and leads the Interaction, Media and Communication Group and Augmented Human Interaction Laboratory in the Department of Computer Science at Queen Mary, University of London. Digital technologies provide uniquely flexible media with the potential to transform human communication. They offer new ways to capture, modify and project communicative actions (eg words, gestures and expressions). This creates the potential for new forms of mutual-engagement and new forms of 'language' or communicative conventions. Pat's research applies models of human communication - drawn mainly from Psychology and Sociology - to understanding these processes. It uses technology both as an experimental tool for the study of interaction and as an application area for testing and developing theories of interaction.

Gini Simpson

Gini Simpson is the head of SPACE Media Arts. SPACE is an arts and education charity based in Hackney, east London. Founded by Brigit Riley in 1968, SPACE innovates and supports the provision of contemporary arts activity in London and provides gallery, public art and training specialisms as well as studio provision across London. SPACE Media Arts undertakes large scale electronic arts projects linking artists and communities and provides open access to new technology in east London. This has included working with award winning artists,

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